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Docket No. AT9-99-085

Date: 6-10-99

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application of Inventor(s):

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09/329461  
06/10/99

For: **METHOD AND APPARATUS FOR ENCODING TRANSACTIONS FOR GOODS  
AND SERVICES USING AN E-RECEIPT**

**Enclosed are also:**

- ☒ 30 Pages of Specification including an Abstract  
☒ 8 Pages of Claims  
☒ 8 Sheet(s) of Drawings  
☒ A Declaration and Power of Attorney  
☒ Form PTO 1595 and assignment of the invention to IBM Corporation

**CLAIMS AS FILED**

FOR	Number Filed		Number Extra		Rate		Basic Fee (\$760)
Total Claims	28	-20 =	8	X	\$ 18	=	\$144
Independent Claims	10	-3 =	7	X	\$ 78	=	\$546
Multiple Dependent Claims	0			X	\$260	=	\$ 0
<b>Total Filing Fee</b>							<b>= \$1450</b>

- ☒ Please charge \$1450 to IBM Corporation, Deposit Account No. 09-0447.  
☒ The Commissioner is hereby authorized to charge payment of the following fees associated with the communication or credit any over payment to IBM Corporation, Deposit Account No. 09-0447. A duplicate copy of this sheet is enclosed.  
☒ Any additional filing fees required under 37CFR § 1.16.  
☒ Any patent application processing fees under 37CFR § 1.17.

Respectfully,

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**METHOD AND APPARATUS FOR ENCODING TRANSACTIONS FOR GOODS  
AND SERVICES USING AN E-RECEIPT**

5 **CROSS-REFERENCE TO RELATED APPLICATIONS**

The present invention is related to application  
entitled "OPTICAL TRANSACTION CARD", serial no.

\_\_\_\_\_ (attorney docket no. AT9-98-759), filed \_\_\_\_\_,  
10 assigned to the same assignee, and incorporated herein by  
reference.

**BACKGROUND OF THE INVENTION**

15 **1. Technical Field:**

The present invention relates generally to an  
improved data processing system and, in particular, to an  
improved method and apparatus for processing electronic  
documents used in a commercial transaction.

20 **2. Description of Related Art:**

A common occurrence in everyday life is the issuance  
and acceptance of a paper receipt as evidence of a  
commercial transaction. Such receipts include vouchers,  
25 sales slips, signed notices, paid bills, proofs of  
payment, statements, sales tickets, admittance, and cash  
register tapes. These items are used almost everywhere  
to provide a consumer and a merchant with some means of  
recording a commercial transaction to ensure that rights  
30 and responsibilities regarding the commercial transaction  
are honored between the parties through the transaction.

Currently, consumers and merchants use paper

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receipts that must be retained not only until the purchase value has been received by the customer but also for future problems regarding claims and responsibilities with regards to the commercial transaction. For the  
5 consumer, maintaining many receipts over a period of time may be difficult. For the merchant, the issuance of a paper receipt almost guarantees that the merchant must create and maintain other paper records that match the paper receipt.

10 For example, in a typical purchasing transaction, a consumer may travel to a home supply store to buy building materials. After paying for some merchandise, the consumer will receive a paper receipt as proof of purchase. If the consumer has purchased some bulky  
15 items, such as lumber, the consumer may be required to proceed to a different location to pick up the lumber, such as a loading dock at the back of the store or at a nearby lumber yard. The consumer's purchase receipt serves as evidence of payment for the lumber and of the  
20 right to delivery of the lumber from an agent of the home supply store. Once the consumer has tendered the receipt, the agent may physically mark the paper receipt to show that the lumber has been delivered, and the lumber is given to the consumer.

25 The use of paper receipts in this situation creates some minor inconveniences. The consumer must ensure that the paper receipt is not lost before the lumber is picked up, which is usually not difficult as the lumber would probably be picked up in a short amount of time.  
30 However, the consumer is required to keep the receipt in case the consumer desires to return any defective

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merchandise. As some stores may allow the return of certain merchandise after several months, the consumer may need to file the paper receipt in a special place to ensure that it is not lost.

5       The merchant also confronts some inconveniences. The home supply store's purchase transaction system may update inventory records immediately upon the sale of the merchandise, even though not all of the merchandise has been removed from the stock. If the purchase transaction  
10      system is set up so that a lumber yard manager must enter a transaction into an electronic terminal to update the inventory records, and the lumber yard manager fails to do so, then the inventory records will not properly match the actual inventory.

15       As is familiar to most consumers, the maintenance and transfer of paper receipts for such purposes may be both cumbersome and annoying. Therefore, it would be useful to have a method and apparatus for electronically transferring proofs of purchase or other documents  
20      related to commercial transactions. It would be further advantageous to have a method and apparatus for transferring and storing detailed information concerning the status and details of a particular commercial transaction. It would be particularly advantageous to  
25      have a method and system for processing this information using physical media that is inexpensive, convenient, and durable.

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### SUMMARY OF THE INVENTION

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The present invention provides a method and apparatus for encoding transactions for goods and services using an electronic receipt or e-receipt. A consumer and a merchant conduct a commercial transaction using a distributed data processing system. An electronic receipt is recorded on a removable storage medium at a first data processing system. The electronic receipt contains data concerning the commercial transaction. The removable storage medium is then read at a second data processing system. After validating the electronic receipt, another commercial transaction or another stage of the original commercial transaction may be performed. The electronic receipt may be validated for a warranty claim on goods or services subject to the purchase transaction, and the removable storage medium may be an optical card or a smart card, either of which is able to store thousands of e-receipts and other electronic documents related to commercial transactions, with the integrity of each guaranteed through digital signature, digital certificate, etc.

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### BRIEF DESCRIPTION OF THE DRAWINGS

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The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

**Figures 1A-1B** is a graphical depiction of a safe card implemented as an optical card that may be used in conjunction with the present invention;

**Figure 2A** is a graphical depiction of a safe card implemented as a smart card;

**Figure 2B** is a block diagram depicting the hardware components within a safe card implemented as a smart card;

**Figure 3A** is a block diagram of a distributed data processing system depicting the use of e-receipts for providing purchase confirmations and other purposes on a safe card implemented as a smart card;

**Figure 3B** is a distributed data processing system depicting the use of e-receipts for providing purchase confirmations and other purposes on a safe card implemented as an optical card;

**Figure 4** is a flowchart depicting a user's or purchaser's perspective of the use of an e-receipt during the useful life of an e-receipt;

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**Figures 5A-5B** is a flowchart depicting the detailed processing of an e-receipt within a distributed data processing system;

**Figure 6** is a flowchart depicting an example of a particular use of a safe card bearing e-receipts; and

**Figures 7A and 7B** are flowcharts depicting a second example using an e-receipt for a particular purchase.

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#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

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With reference now to **Figures 1A-1B**, a graphical depiction is provided for a safe card implemented as an optical card that may be used in conjunction with the present invention. **Figure 1A** shows optical card **100**, which is similar to optically readable CD-ROMs that are used for distributing music. One side of the card is printed with information while the other side has a transparent coating protecting a layer of readable bits. Optical card **100** is about the same size as a credit card.

10  
15 **Figure 1B** shows a cross-sectional, magnified, not-to-scale view of an optical card with an encoded surface that may be read as a binary series of ones and zeroes by an optical laser as is well-known in the art.

A safe card is a writable/readable media whose integrity is assured through a digital signature, digital certificate, etc. The safe card, when implemented as an optical card, contains a large amount of storage capacity that may be written once and read many times. To read and write to the safe card, the safe card may be swiped through a read/write machine by a manual action. As will be described in further detail below, the owner of the safe card may perform this action twice in a typical purchase transaction. The first swipe writes an electronic receipt (or e-receipt) on the safe card, and the second swipe reads the electronic receipt when presenting the safe card to the merchant for delivery of

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goods or services that were recently purchased.

Alternatively, a safe card may also be inserted into an optical card machine in a manner similar to inserting an automated teller machine (ATM) card into an ATM, in which  
5 case the optical card machine may hold the card until the end of the transaction. As another alternative embodiment, the functionality of a safe card may be combined with the functionality of a credit card or an ATM card on a single computer-readable medium. This type  
10 of multi-purpose card may provide the user with the convenience of carrying fewer cards.

A laser initially scans the information present on the optical card. The operator of the optical card machine may input a command that causes information to be  
15 stored on the card. An amount of data can be written onto an unused portion of the card, after which the information may be read many times. Once a specific portion of the optical card has been used, it may not be reused to store other useful information. However, an  
20 optical card machine may write over a previously used portion of the card in order to destroy the previously stored information.

A safe card may store information regarding particular purchases made by the owner of the safe card  
25 and recorded as electronic receipts, or e-receipts, on the safe card by a merchant. After a consumer has purchased a product or service, the consumer has the option to receive a paper receipt providing proof of the commercial transaction, but in accordance with the  
30 present invention, the consumer may either solely or optionally present a safe card to the merchant so that

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the merchant may electronically record the purchase on the safe card.

5 A major advantage of using optical cards as safe cards for storing e-receipts is that optical cards are inexpensive. Typically, they cost only a few cents to manufacture. Hence, merchants may give away safe cards to their customers as a value-added convenience for their customers.

10 Over a long period of time, a user may repeatedly present a safe card to a series of merchants, and the memory on the safe card gradually fills with electronic documents from the merchants. Because a safe card may hold many megabytes of information and the electronic documents may be only as large as a few kilobytes of  
15 information, a safe card may provide enough storage capacity for several years of purchases. If the safe card is implemented as an optical card, the safe card may be durable enough to provide years of use without problems.

20 With reference now to **Figure 2A**, a graphical depiction is provided for a safe card implemented as a smart card that may be used in conjunction with the present invention. Although a smart card provides additional functionality that can not be provided by an  
25 optical card, a smart card has inherent disadvantages compared to an optical card. Smart cards are more expensive to produce, which may limit the willingness of merchants to provide smart cards as free safe cards to customers or the willingness of customers to purchase  
30 smart cards as convenient safe cards for storing e-receipts. Smart cards are also more fragile than an

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optical card, which may be exposed to magnetic fields, etc. without harming the optical card.

Smart card **250** includes power switch **252**, input control buttons **254**, and electronic display **256**. Buttons **254** may be used by a purchaser or owner of the smart card for inputting and selecting specific functions provided by an application operating on the smart card. Display **256** presents information to the user of the smart card generated by applications within the smart card. In the provided example, an e-receipt application is executing on the smart card providing the safe card functions.

Display **256** presents information regarding particular purchases made by the user of the safe card and recorded as e-receipts on the safe card. Display **256** shows categories of information from the e-receipt application regarding purchase information **258**, merchant information **260**, dates **262**, associated receipt information **264**, and warranty information **266**. Each of these categories contains information displayed in a column fashion that may be sorted by column so that the purchaser may have access to e-receipts recorded from the safe card.

Purchase information **258** displays individual items that have been purchased by the user of the safe card over a particular period of time. The e-receipt application on the smart card may provide the user with the ability to selectively edit and delete purchase information stored on the smart card. Merchant information **260** shows the merchants or vendors from which purchases have been made. The e-receipt application on smart card **250** may contain an associated merchant

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database that provides more detailed information to the user on display **256** as required by the user. Detailed information may include the physical or geographic location of the merchant, merchant contact information, such as the fax number, phone number, web page, etc. Date information **262** shows the date and optionally the time that the purchase occurred.

Receipt information **264** contains information associated with the recording of a particular purchase as an e-receipt on the safe card. For example, this information may provide the user with information concerning the processing status of the purchase, the e-receipt status within the safe card, number of times that the e-receipt has been accessed or used, etc. Warranty information **266** contains information concerning the existence of a warranty on the associated purchase. Other warranty information may be provided, such as the provider of the warranty, the merchant from whom the purchase was made, and a credit card company that provided a credit card transaction for a particular purchase that may provide an additional warranty on the product.

In the examples shown in **Figure 2A**, purchase **268** shows that the item that was purchased was an amount of lumber bought at a merchant named "Wood Guys" on a date of April 30. The receipt entry for purchase **268** shows a status of "transit" that may indicate that the lumber is currently in transit to a particular location at which the user had requested the lumber to be delivered. The warranty entry for purchase **268** shows that the user purchased the lumber without a warranty.

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Purchase **270** displayed on the safe card shows that the user purchased tires from a merchant named "Tire Guys" on a date of May 1. The receipt information associated with purchase **270** shows that the tires are  
 5 currently being installed. This may be the case if the user is currently at the merchant having the tires installed on the user's vehicle. The warranty entry associated with purchase **270** shows that the tires were purchased with an included warranty. This indicates that  
 10 there may be more information available about the warranty stored on the smart card.

Other useful information may be provided to the user by an e-receipt application. For example, the e-receipt application may include maintenance tips or installation  
 15 guidelines for the user's purchase that were stored on the safe card at the same time that the e-receipt was stored on the safe card. Detailed purchase information concerning the items that were purchased may also be stored on the safe card. In the example provided in  
 20 **Figure 2A**, purchase **268** may include data about the number of board-feet that were purchased, the type of lumber that was purchased, the origin of the lumber, and any associated notes concerning the condition of the lumber. Purchase **270** may include the number of tires that were  
 25 purchased, the make and model of tires that were purchased, and the date of manufacture for the tires. Each type of purchase may require specific detailed purchase information to be stored along with the e-receipt of that purchase.

30 With reference now to **Figure 2B**, a block diagram depicts the hardware components within a smart card that

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may be used to implement the present invention. Safe card **200** contains a CPU **202** that provides processing capabilities to various applications located on safe card **200**. Memory **204** provides temporary storage for the  
5 loading and processing of applications. Non-volatile memory **206** provides storage for applications and their related databases. Display adapter **208** generates presentation data to be shown on display **210**. Button control unit **212** reads and processes user selections of  
10 buttons on the physical interface of safe card **200**. I/O interface unit **214** allows safe card **200** to interface with various safe card readers, scanners, modems, or other computer or network related items.

Button control unit **212** allows a user to input  
15 various selections and data to applications on safe card **200**. Additional input devices may be included with or interfaced to safe card **200**. Display **210** may be physically integrated with safe card **200**, although other display units may be connected to safe card **200**.  
20 Non-volatile memory **206** may include a variety of storage devices and capabilities, such as read-only memory, flash ROM, or an IBM MicroDrive, a product of International Business Machines Corporation, located in Armonk, New York. Safe card **200** may also include a Java Virtual  
25 Machine capable of running Java applications and applets. Those of ordinary skill of the art will appreciate that the hardware in **Figure 2B** may vary depending on the implementation.

Although the safe cards have been described as being  
30 implemented as optical cards and smart cards, other types

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of recordable media may be used, such as floppy disks, cards with magnetically recordable strips, etc. The present invention should not be interpreted as limited to only the recordable media described above.

5       With reference now to **Figure 3A**, a distributed data processing system depicts the use of e-receipts for providing purchase confirmations and other purposes on a safe card implemented as a smart card. Safe card **310** may be similar to safe card **200** shown in **Figure 2**. A user of  
10 safe card **310** is able to provide input to applications on safe card **310** through user input **312**. The user receives useful information from safe card **310** through user output **314**. Safe card **310** contains e-receipt application **316** that provides functionality for processing e-receipts  
15 within data processing system **300**. Safe card **310** also has e-receipt database **318** for storing e-receipts in a non-volatile manner.

E-receipt database **318** may include many different types of information associated with e-receipts, such as  
20 help files, merchant information, product use, and installation, etc. Safe card **310** receives e-receipt **329** from a merchant system and directs e-receipt **329** to e-receipt application **316**. Safe card **310** interfaces with the merchant system through merchant scanner **327**.  
25 Merchant scanner **327** may be similar to a barcode scanner normally found connected to electronic cash registers. Merchant scanner **327** also may be similar to a smart card reader, or some other type of card reader that may receive and transmit e-receipt **329** and associated  
30 information with smart card **310**.

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Merchant scanner **327** sends and receives information to and from merchant server **322** through merchant station **320**. This information may include purchase applications, inventory applications, etc. Merchant station **320**

5 contains an input device, such as a keyboard, and an output device, such as a display, that allows the merchant or merchant's agent to interact with the transaction system. User station **323** contains an input device, such as a keyboard, and an output device, such as

10 a display, that allows a consumer to enter information that may be necessary for using the smart card, such as a Personal Identification Number (PIN), etc. In this manner, the consumer station may resemble systems that are frequently found in supermarket checkout stations.

15 Merchant server **322** reads and writes to transaction database **324**, which records information concerning user purchases and claims for products and services from the merchant.

With reference now to **Figure 3B**, a distributed data

20 processing system depicts the use of e-receipts for providing purchase confirmations and other purposes on a safe card implemented as an optical card. Safe card **360** may be similar to safe card **100** shown in **Figure 1**. Safe card **360** has storage capacity for storing e-receipts and

25 other related information in a non-volatile manner after receiving the e-receipt from data processing system **350**.

Safe card **360** may include many different types of information associated with e-receipts, such as help files, merchant information, product use, and

30 installation, etc. Safe card **360** receives e-receipt **359**



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through merchant scanner **352**, which may be similar to a barcode scanner normally found connected to electronic cash registers or to an ATM. Merchant scanner **352** sends and receives information to and from merchant server **354**  
5 through merchant station **353**. This information may include purchase applications, inventory applications, etc. Merchant station **353** contains an input device, such as a keyboard, and an output device, such as a display, that allows the merchant or merchant's agent to interact  
10 with the transaction system. User station **355** contains an input device, such as a keyboard, and an output device, such as a display, that allows a consumer to enter information that may be necessary for using the smart card, such as a Personal Identification Number  
15 (PIN), etc. In this manner, the consumer station may resemble systems that are frequently found in supermarket checkout stations. Merchant server **354** reads and writes to transaction database **356**, which records information concerning user purchases and claims for products and  
20 services from the merchant.

The transmittal of an e-receipt may include a digital signature to ensure that the user of a safe card has been properly identified as a particular customer known or previously identified within the merchant's  
25 commercial transaction system. The digital signature may encode the information on the safe card so that only the owner of the safe card, or only the merchant that placed the information on the safe card, may read the particular electronic documents on the safe card. The digital  
30 signature also protects the integrity of the document by preventing and/or detecting changes to the e-receipt.

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The e-receipt may include any additional information required to complete the electronic purchase other than information concerning the product or service being purchased. For example, the e-receipt may include a  
5 consumer or purchase identification number, a merchant or vendor identification number, and other information necessary for identifying the particular commercial transaction to distinguish it from other commercial transactions within the merchant system.

10 As another example, the e-receipt may include the credit card number that was used in the original commercial transaction. Some credit card companies automatically extend the warranty of a product that was purchased with a credit card issued by the credit card  
15 company. By storing the credit card number used during the original purchase along with the warranty information for the product recorded in the e-receipt, the user of the safe card has a convenient record of the length of an automatically extended warranty.

20 Other configurations for data processing systems may be used for writing and reading information to and from safe cards. For example, a handheld portable device may contain a scanner unit through which a safe card may be swiped. A person delivering some type of goods that have  
25 been previously purchased could require that a person accepting the delivery must present a safe card with a proper e-receipt. Once the handheld device authenticates the e-receipt, the goods may be delivered, at which point the safe card may be swiped a second time so that the  
30 actual delivery of the goods may be recorded onto the safe card. At the same time, the handheld device creates

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a record that is either stored and later downloaded to the merchant's main system or that is wirelessly transmitted to the merchant's main system so that the main system may update inventory records and reconcile the delivery of the goods with the original purchase transaction.

With reference now to **Figure 4**, a flowchart depicts a user's or purchaser's perspective of the use of an e-receipt during the useful life of an e-receipt. The process begins when a user purchases a product or service (step **402**). The user receives an e-receipt (step **404**) that may be stored by the user on a safe card. The user presents the e-receipt stored on the device to claim a product or service from a merchant (step **406**). After the user receives the product or service (step **408**), the user presents the e-receipt so that delivery of the product or service may be recorded electronically on the e-receipt (step **410**). The user then retains the e-receipt for future service and warranty claims (step **412**).

In the two stage process of recording the original receipt and recording the delivery of goods, the merchant's system may operate in any number of alternative, equivalent manners. The merchant system may "mark" an e-receipt for a purchase as having had goods or services delivered in the following manner: the originally recorded receipt is destroyed by overwriting the original binary information; and a new receipt that contains the delivery information in addition to the original purchase information is written onto an unused portion of the safe card. Alternatively, the delivery information is written onto an unused portion of the safe

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card with a pointer to the original purchase information. As another alternative, the safe card memory is divided into portions available to any merchant. Once a merchant "claims" an area of memory by writing some information,  
5 the rest of the area is reserved for that merchant.

The methods of storing information onto a safe card are merely provided as examples and are not meant as limitations for the present invention.

With reference now to **Figures 5A-5B**, a flowchart  
10 depicts the detailed processing of an e-receipt within a distributed data processing system. The process begins when a user purchases a product or service from a merchant (step **502**). The merchant server, in conjunction with an electronic cash register or other purchasing  
15 system or software application, records the purchase in a transaction record for the user (step **504**). The user then presents a safe card for recording the purchase (step **506**). The merchant scanner encodes an e-receipt on the safe card (step **508**). This may occur when a user  
20 physically swipes the safe card through an electronic scanner or reader specifically adapted for interfacing with the safe card. Alternatively, an ATM-type device could be used where the card is used both for transferring funds electronically and storing transaction  
25 records such as e-receipts on the card after receipt from the ATM-type device.

The user presents the safe card bearing the e-receipt for a purchase when claiming the product or service (step **510**). At some point in time after  
30 completing the purchase transaction, a consumer may need to pickup or receive delivery of a product that could not

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physically be delivered immediately upon completion of the purchase. For example, in some cases a consumer may be required to travel to another location such as a warehouse in order to receive the product that has been  
5 purchased.

In other situations, a user completes a purchase at a cash register location within the merchant's facilities yet must proceed to a delivery counter to pickup a purchased product. In these situations, the method and  
10 process of the present invention provides a way for verifying a consumer's claim for product. In the case of purchasing a service, many situations require the closing of a purchased transaction at one location while the service may be delivered at a later time and different  
15 location. In those cases, the electronic receipts provided by the present invention may be particularly useful for verifying the user's claim for a service.

The merchant scanner examines the safe card for receipts after the user has presented the safe card to  
20 claim a product or service (step 512). It is assumed that the merchant's system may only interpret the e-receipts that have been placed on the safe card by that merchant. Otherwise, the merchant would be able to read the consumer's other e-receipts and obtain information  
25 concerning rival merchants from which the consumer has purchased something. Hiding the e-receipts may be accomplished by suitable encryption or encoding of the e-receipt while maintaining a universal directory on the safe card that many different merchant systems may write  
30 to and read from. If the merchant chooses to use some type of encryption key, then the merchant may be assured

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that a decryptable e-receipt on the safe card has been written to the safe card by the merchant and not forged.

In a situation in which the user has many e-receipts concerning a particular product or service, the user may  
5 optionally enter a Personal Identification Number (PIN) and indicate the appropriate e-receipt that is to be used for the current delivery of the product or service (step 514). After the merchant scanner has transmitted the e-receipt to the system of the merchant, the merchant  
10 server matches the e-receipt to the proper purchase transaction record stored within the transaction database (step 516). The merchant then receives a verification from the merchant server or system (step 518), and the user receives the product or service (step 520). The  
15 user then presents the safe card for recording the delivery of the product or service upon the appropriate e-receipt (step 522). The merchant scanner then encodes the delivery into the e-receipt stored on the safe card (step 524). In some cases, an automated machine may hold  
20 the consumer's safe card for both the reading of the e-receipt and the recording of the delivery of the product. However, it is contemplated that the safe card remains under the personal control of its owner in a manner similar to handling a credit card. The merchant  
25 server also records the delivery of the product or service into the appropriate server transaction record stored in the merchant's database (step 526). The merchant server or system can then adjust the merchant's inventory records as appropriate (step 528). The user  
30 then retains the e-receipt as a proof of purchase for future service or warranty as necessary (step 530). At

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the appropriate time the user may present the safe card with the e-receipt for other deliveries of products or services in accordance with the user's previous purchase.

With reference now to **Figure 6**, a flowchart depicts an example of a particular use of a safe card bearing e-receipts. The process begins when a user purchases a quantity of lumber (step **602**). An e-receipt for the lumber purchase is encoded onto the safe card of the purchaser (step **604**). At some later point in time, the user swipes the safe card for the lumber yard manager (step **606**). The user's claim for a quantity of lumber is verified by the merchant system, and the lumber is taken from the appropriate stock (step **608**). The user receives the lumber, and the user then swipes the safe card to confirm the receipt (step **610**). The appropriate quantity of lumber is removed from the merchant's inventory, and the user's purchase transaction record is updated to reflect the physical delivery of the lumber (step **612**). The user may then retain the e-receipt for personal records (step **614**).

With reference now to **Figures 7A - 7B**, flowcharts depict a second example using an e-receipt for a particular purchase. In **Figure 7A**, the process begins when a user purchases a set of tires (step **702**). An e-receipt for the tire purchase is then encoded onto the safe card of the purchaser (step **704**). At some later point in time, the user may desire to receive the tires. Since tires are a bulky item that may require special handling and delivery, the location for receiving the tires may be separated from the location at which the user pays for the purchase of the tires. For example,

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the user may need to proceed to the rear of a warehouse or to a warehouse at a different location to receive the tires. As another example, the tires may be delivered to the location of the purchase but at a later date.

5       At some later point in time, the user presents the safe card bearing the e-receipt and swipes the safe card through a safe card reader for a shop manager (step 706). The user's claim for the tires is verified within the merchant's system and the tires are taken from the  
10 merchant's stock (step 708). The user's tires are then installed, and the user again swipes the safe card to confirm the receipt of the tires (step 710). The merchant's inventory records are updated to reflect the removal of the tires from the merchant's stock, and the  
15 user's purchase record is updated (step 712). The user then retains the e-receipt on the user's safe card for future warranty claims and for potential rotation and balancing services on the recently purchased tires (step 714). At this point, the process ends as the user may  
20 not access the e-receipt for a significant period of time.

As shown in **Figure 7B**, at some future point in time, the user desires to have the tires rotated and balanced. Upon arrival at the appropriate location, the user swipes  
25 the safe card bearing the e-receipt for the originally purchased tires in order to present the user's claim for tire servicing (step 716). The merchant's system verifies the claim and provides an indication that a service order has been authorized for the tire services  
30 (step 718). The user's tires are then rotated and balanced, and the user again swipes the safe card to



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confirm the receipt of the tire services (step 720). The merchant's system may be updated to reflect that lead weights used during the rotation and balance services have been removed from the merchant's inventory, and the merchant's system also updates the user's service record that is associated with the user's original purchase transaction (step 722). The user may then retain the e-receipt for future rotation and balancing requests or other warranty requests associated with the purchased tires (step 724). If the user desires further service, then the process loops back to step 716. **Figure 7B** describes an essentially non-terminating loop. However, if the e-receipt is overwritten or the safe card is destroyed, etc., then the process ends.

Although it is assumed that both the merchant and the consumer act honorably and reasonably during the history of any and all purchase transactions, situations may arise in which a safe card does properly reflect what is stored in the merchant server or what is remembered by either the merchant or the consumer. To prevent these circumstances, an audit trail or transaction log may be stored simultaneously on the merchant server and on the safe card. When the transaction logs fail to match, the burden of correcting any discrepancies may be placed on the merchant because the merchant has the opportunity to encrypt the information on the safe card to prevent tampering with the information on the safe card. The storage of information on the safe card and on the merchant server is also under the control of the merchant, making it rather difficult for the consumer to create false records.

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The convenience of the e-receipts provided by the present invention can be contrasted with the inconveniences caused by paper receipts. If one is required to keep all business related receipts for tax purposes during a calendar year, it may be difficult to separate personal expenses from business expenses. With e-receipts, a user of a safe card may input an indicator into the safe card for each particular type of purchase so that the e-receipt application on a safe card may manually sort the different types of expenses.

With paper receipts, one must manually mark the receipts or manually sort the receipts into various record-keeping envelopes. As another example of the inconvenience of a paper receipt, when one is required to return a previously purchased product, one must usually present a paper receipt that proves that one has purchased the product at a particular merchant. In some situations, the merchant desires to keep the paper receipt for the purchase. In other situations, the merchant may physically mark the receipt to show that a product has been returned. However, if the purchase included many different products, then the purchaser may need to use the paper receipt for several different purchased items. If the consumer desires to return only one item out of the many items on the original receipt, there may be several difficulties related to copying the original receipt, marking the original receipt, and insuring that the purchaser maintains a valid receipt for the other items that have been purchased.

Other advantages of the present invention should be apparent in light of the detailed description of the

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invention provided above. Currently, businesses and users must use paper receipts to provide evidence of purchases for various situations, such as the presentation of a receipt for the delivery of a  
5 previously purchased product, the return of merchandise, the presentation of a claim for service on a product that was purchased, a claim for services, and a claim for an ongoing, periodic service contract relationship, the presentation of a warranty request for a product  
10 previously purchased, etc. In each of these cases, a consumer must keep track of paper receipts until they are deemed no longer useful.

By storing e-receipts on a safe card, the consumer may conveniently keep all receipts for purchases for  
15 particular kinds of expenses or for periodic accounting purposes on a single safe card. Moreover, since safe cards may be manufactured as inexpensive optical cards, merchants may issue store-specific safe cards to each consumer, and a consumer may keep a different safe card  
20 for each merchant that the consumer visits on a regular basis.

Each consumer may decide how best to organize different e-receipts on different safe cards. A consumer may decide to keep personal expenses on one card and  
25 business-related receipts on another card, or a consumer may decide to keep restaurant e-receipts on one card and all grocery purchases on another safe card.

Besides the conveniences provided by e-receipts over ordinary paper receipts, the process in the present  
30 invention for scanning a user's e-receipt safe card provides a more secure method for ensuring that the

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product or service that has been purchased is delivered to the properly identified purchaser. The merchant also receives the benefit of being able to accurately track inventory at the time that the product or service is  
5 actually delivered.

As a further example, when a consumer visits a movie theater, the consumer purchases a movie ticket. The movie ticket provides the dual purpose of a receipt for the purchase and a token for physical admittance to the  
10 theater. Usually, half a paper ticket is surrendered to gain admittance to the theater. This allows the theater owner to track how many persons have entered a theater for a particular movie showing, and it also allows the theater owner to mark the movie ticket in a manner that  
15 shows that the ticket has been used and a service delivered. However, if a theater owner desires to know the actual occupancy of a theater after the tickets to a particular movie showing have been sold, the theater owner must manually count the tickets that have been  
20 redeemed for a particular showing, or the theater owner must manually count the number of empty seats that remain in a theater. If the particular movie showing is interrupted, a theater owner may issue "rain checks" to allow the movie patrons to return for another showing of  
25 the movie so that the theater owner delivers the service that has been purchased by the movie patrons. In that situation, the movie patrons surrender the remaining portion of the movie ticket receipt and receive another ticket or rain check as a paper receipt for evidence for  
30 a future claim for a movie showing.

With a safe card, the following scenario may be

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realized which provides numerous advantages. A consumer purchases an admittance to a theater to watch a movie. The consumer either presents a safe card at the box office so that a movie ticket e-receipt may be placed on  
5 the safe card by swiping the safe card and encoding a movie ticket onto the safe card, or the theater issues the consumer a safe card with a movie ticket e-receipt encoded on the safe card. When the movie theater patron wants to enter the theater, the patron swipes the safe  
10 card to gain entrance to the theater, and the theater owner simultaneously knows that one seat in the theater has been occupied. If the movie is interrupted, then a patron presents the safe card containing the movie ticket e-receipt. The safe card is swiped so that a rain check  
15 may be encoded onto the safe card that allows the patron to return at some time in the future and gain admittance to another movie showing at no charge. The patron presents the safe card with the rain check and swipes the card to gain entrance to the theater. The theater owner  
20 can then keep a running total of how many patrons returned to redeem their rain checks and whether the patrons desired to see the same movie that was originally interrupted.

It is important to note that while the present  
25 invention has been described in the context of a fully functioning data processing system, those of ordinary skill in the art will appreciate that the processes of the present invention are capable of being distributed in the form of a computer readable medium of instructions  
30 and a variety of forms and that the present invention applies equally regardless of the particular type of

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signal bearing media actually used to carry out the distribution. Examples of computer readable media include recordable-type media such a floppy disc, a hard disk drive, a RAM, and CD-ROMs and transmission-type  
5 media such as digital and analog communications links.

The description of the present invention has been presented for purposes of illustration and description, but is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and  
10 variations will be apparent to those of ordinary skill in the art. The embodiment was chosen and described in order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for  
15 various embodiments with various modifications as are suited to the particular use contemplated.

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**CLAIMS:**

What is claimed is:

- 5 1. A method for conducting a commercial transaction in a distributed data processing system, the method comprising the computer-implemented steps of:
- recording an electronic receipt on a removable storage medium at a first data processing system, the
- 10 electronic receipt comprising data concerning a commercial transaction;
- reading the removable storage medium at a second data processing system;
- validating the electronic receipt stored on the
- 15 removable storage medium at the second data processing system; and
- in response to validating the electronic receipt, conducting a commercial transaction.
- 20 2. The method of claim 1 wherein the step of validating the electronic receipt further comprises inspecting a digital signature to verify the integrity of the electronic receipt.
- 25 3. A method for processing an electronic receipt, the method comprising the computer-implemented steps of:
- processing a purchase transaction;
- generating an electronic receipt comprising data concerning the purchase transaction;
- 30 storing the electronic receipt on a removable storage medium;

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reading the electronic receipt on the removable storage medium;

validating the electronic receipt; and

in response to validating the electronic receipt,  
5 providing an indication to proceed with a delivery of goods or services related to the purchase transaction.

4. The method of claim 3 wherein the step of validating the electronic receipt further comprises inspecting a  
10 digital signature to verify the integrity of the electronic receipt.

5. A method for processing an electronic receipt, the method comprising the computer-implemented steps of:  
15 reading an electronic receipt from a removable storage medium;  
validating the electronic receipt; and  
in response to validating the electronic receipt,  
providing an indication to proceed with a delivery of  
20 goods or services related to a purchase transaction.

6. The method of claim 5 further comprising:  
processing a purchase transaction;  
generating an electronic receipt comprising data  
25 concerning the purchase transaction; and  
storing the electronic receipt on a removable storage medium.

7. The method of claim 5 further comprising:  
30 reading the electronic receipt from the removable storage medium;



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generating a modified electronic receipt comprising data concerning the delivery of goods or services for the purchase transaction; and

5 storing the modified electronic receipt on the removable storage medium.

8. The method of claim 5 further comprising:  
prior to validating the electronic receipt,  
selecting one of a plurality of electronic receipts in  
10 accordance with user input.

9. The method of claim 5 wherein the electronic receipt may be validated a number of times for a purchase transaction that requires a plurality of deliveries of  
15 good or services.

10. The method of claim 5 wherein the electronic receipt may be validated for a claim for servicing of a product subject to the purchase transaction.  
20

11. The method of claim 5 wherein the electronic receipt may be validated for a warranty claim on goods or services subject to the purchase transaction.

25 12. The method of claim 5 wherein the removable storage medium is a smart card.

13. The method of claim 5 wherein the removable storage medium is an optical card.  
30

14. The method of claim 5 wherein the step of validating

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the electronic receipt further comprises inspecting a digital signature to verify the integrity of the electronic receipt.

- 5 15. A data processing system for conducting a commercial transaction, the data processing system comprising:

input means for inputting commercial transaction data;

transmitting means for transmitting commercial  
10 transaction data to a merchant server;

receiving means for receiving commercial transaction data from a merchant server;

display means for displaying commercial transaction data;

15 reading means for reading a removable storage medium for storing electronic receipts, the electronic receipts comprising commercial transaction data; and

recording means for recording an electronic receipt on the removable storage medium.

20

16. A data processing system for conducting a commercial transaction, the data processing system comprising:

reading means for reading a removable storage medium for storing an electronic receipt, the electronic

25 receipts comprising commercial transaction data;

validating means for validating the electronic receipt; and

indicating means for providing an indication to proceed with a delivery of goods or services related to  
30 the purchase transaction in response to validating the electronic receipt.

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17. The data processing system of claim 16 wherein the  
indicating means displays information concerning a type  
and quantity of goods encoded within the electronic  
5 receipt.

18. The data processing system of claim 16 wherein the  
validating means further comprises inspecting means for  
inspecting a digital signature to verify the integrity of  
10 the electronic receipt.

19. A data processing system for conducting a commercial  
transaction, the data processing system comprising:  
receiving means for receiving purchase transaction  
15 data from a point-of-sale data processing system;  
generating means for generating an electronic  
receipt corresponding to the purchase transaction data;  
storing means for storing the purchase transaction  
data and the corresponding electronic receipt in a  
20 datastore; and  
transmitting means for transmitting the electronic  
receipt to the point-of-sale data processing system.

20. A data processing system for conducting a commercial  
25 transaction, the data processing system comprising:  
processing means for processing a purchase  
transaction;  
generating means for generating an electronic  
receipt comprising data concerning the purchase  
30 transaction; and  
storing means for storing the electronic receipt on

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a removable storage medium;

reading means for reading the electronic receipt on the removable storage medium;

validating means for validating the electronic receipt; and

indicating means for providing an indication to proceed with a delivery of goods or services related to the purchase transaction in response to validating the electronic receipt.

10

21. The data processing system of claim 20 wherein the validating means further comprises inspecting means for inspecting a digital signature to verify the integrity of the electronic receipt.

15

22. An article of manufacture comprising:

a protective layer comprising human-readable printed information; and

a substrate layer comprising a plurality of bit locations encoding machine-readable information readable by optical means, wherein the machine-readable information comprises an electronic receipt, wherein the electronic receipt comprises commercial transaction data concerning a purchase of products or services.

25

23. The article of manufacture of claim 22 wherein the commercial transaction data comprises a merchant identifier, a date of purchase, and a product or service identifier.

30

24. The article of manufacture of claim 22 wherein the

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electronic receipt is protected by a digital signature.

25. A computer program product in a computer-readable medium for conducting a commercial transaction, the

5 computer program product comprising:

first instructions for recording an electronic receipt on a removable storage medium at a first data processing system, the electronic receipt comprising data concerning a commercial transaction;

10 second instructions for reading the removable storage medium at a second data processing system;

third instructions for validating the electronic receipt stored on the removable storage medium at the second data processing system; and

15 fourth instructions for conducting a commercial transaction in response to validating the electronic receipt.

26. The computer program product of claim 25 wherein the  
20 instructions for validating the electronic receipt further comprise instructions for inspecting a digital signature to verify the integrity of the electronic receipt.

25 27. A computer program product in a computer-readable medium for processing an electronic receipt, the computer program product comprising:

first instructions for processing a purchase transaction;

30 second instructions for generating an electronic receipt comprising data concerning the purchase

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transaction;

third instructions for storing the electronic receipt on a removable storage medium;

fourth instructions for reading the electronic receipt on the removable storage medium;

fifth instructions for validating the electronic receipt; and

sixth instructions for providing an indication to proceed with a delivery of goods or services related to the purchase transaction in response to validating the electronic receipt.

28. The computer program product of claim 27 wherein the instructions for validating the electronic receipt further comprise instructions for inspecting a digital signature to verify the integrity of the electronic receipt.

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**ABSTRACT OF THE DISCLOSURE**

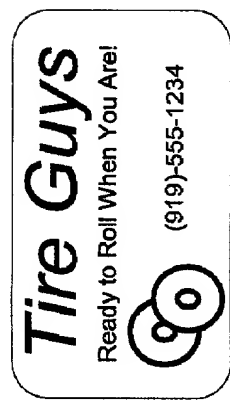
**5      METHOD AND APPARATUS FOR ENCODING TRANSACTIONS FOR GOODS  
         AND SERVICES USING AN E-RECEIPT**

10      A method and apparatus for encoding transactions for  
         goods and services using an e-receipt is provided. A  
         consumer and a merchant conduct a commercial transaction  
         using a distributed data processing system. An  
         electronic receipt is recorded on a removable storage  
         medium at a first data processing system. The electronic  
15      receipt contains data concerning the commercial  
         transaction. The removable storage medium is then read  
         at a second data processing system. After validating the  
         electronic receipt, another commercial transaction or  
         another stage of the original commercial transaction may  
20      be performed. The electronic receipt may be validated  
         for a warranty claim on goods or services subject to the  
         purchase transaction, and the removable storage medium  
         may be an optical card or a smart card, either of which  
         is able to store thousands of e-receipts and other  
25      electronic documents related to a commercial transaction,  
         with the integrity of each guaranteed through digital  
         signature, digital certificate, etc.

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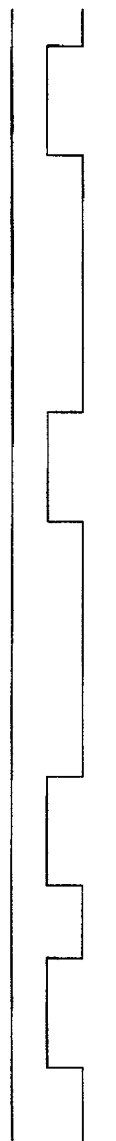
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Figure 1A  
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Figure 1B  
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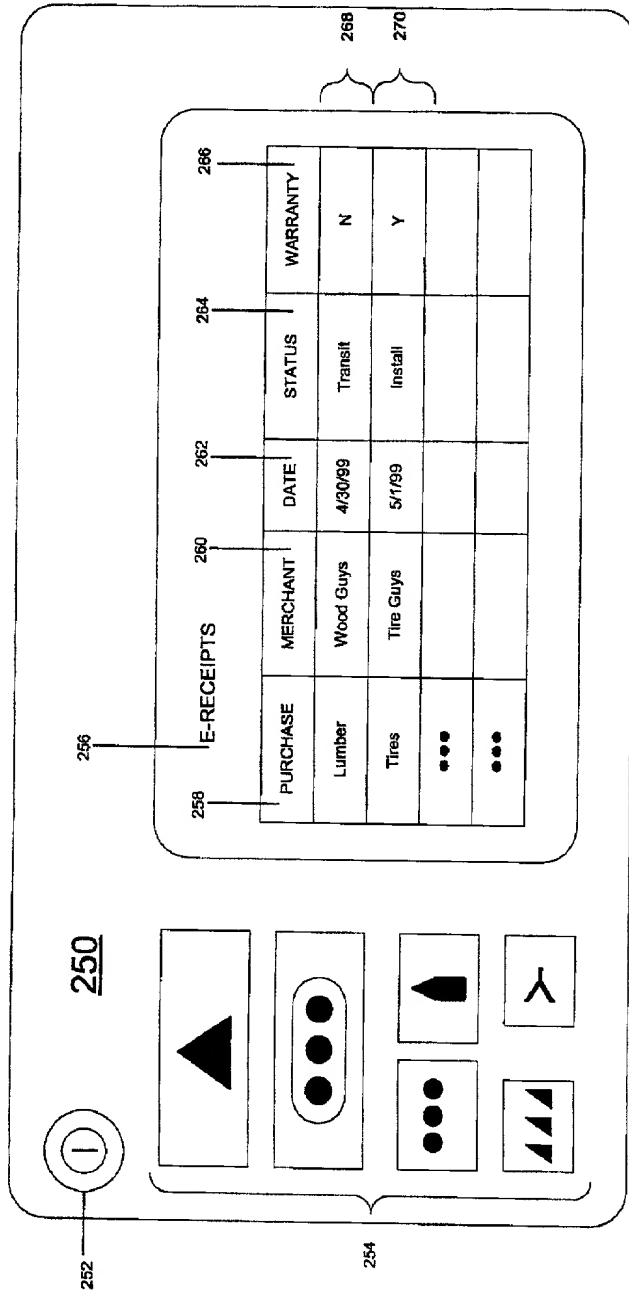


Figure 2A  
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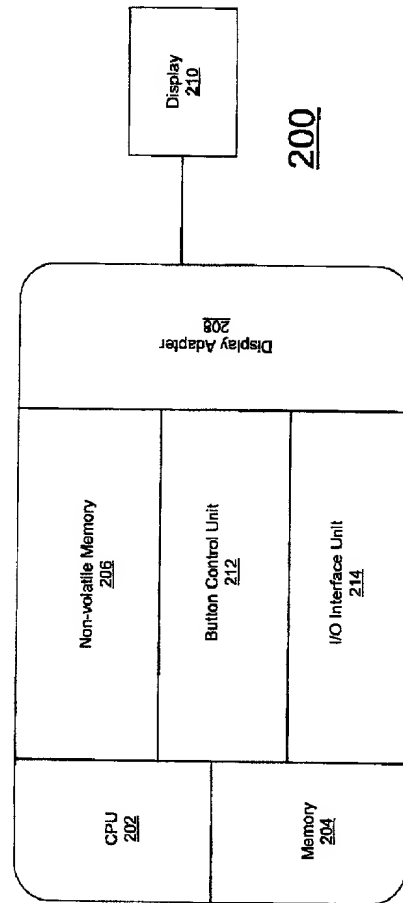


Figure 2B  
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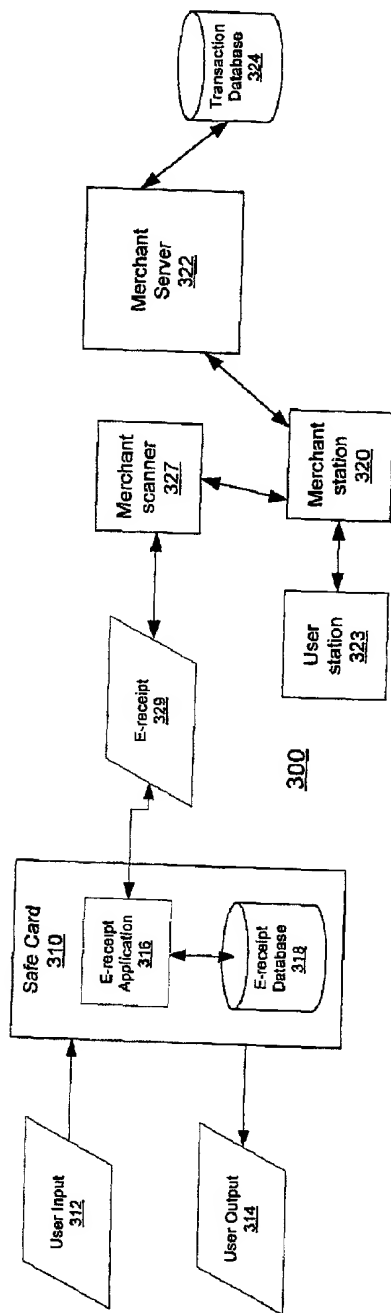


Figure 3A

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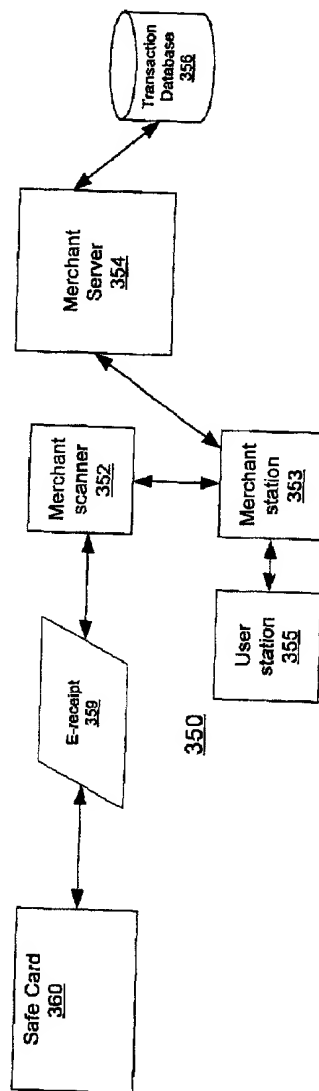


Figure 3B

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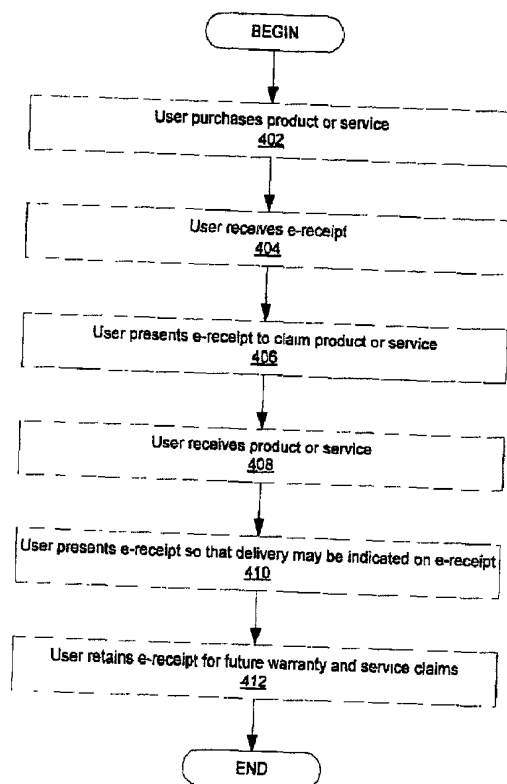


Figure 4

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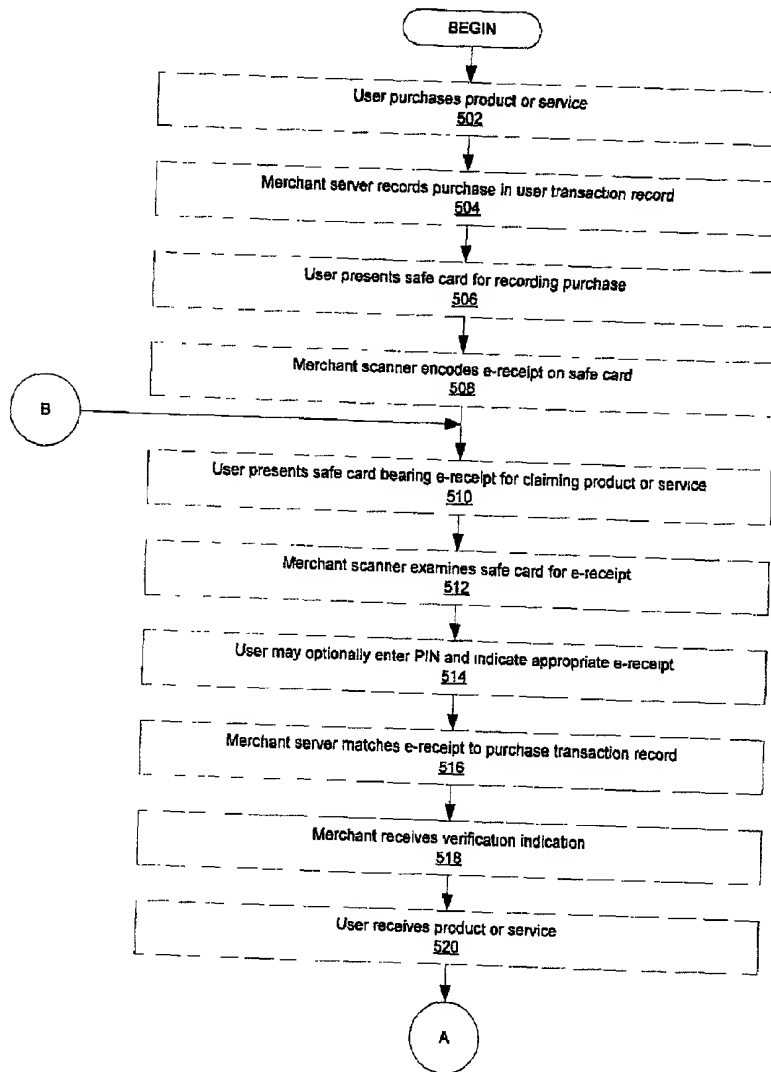


Figure 5A

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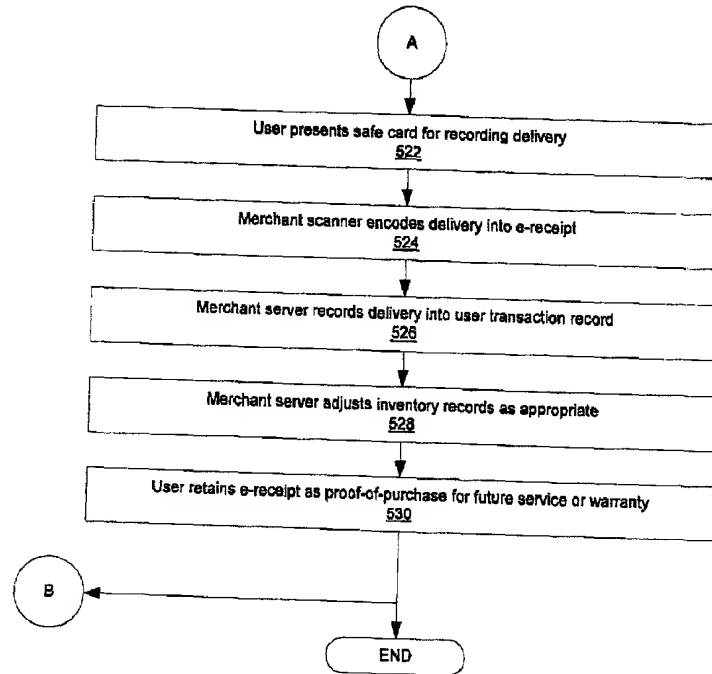


Figure 5B

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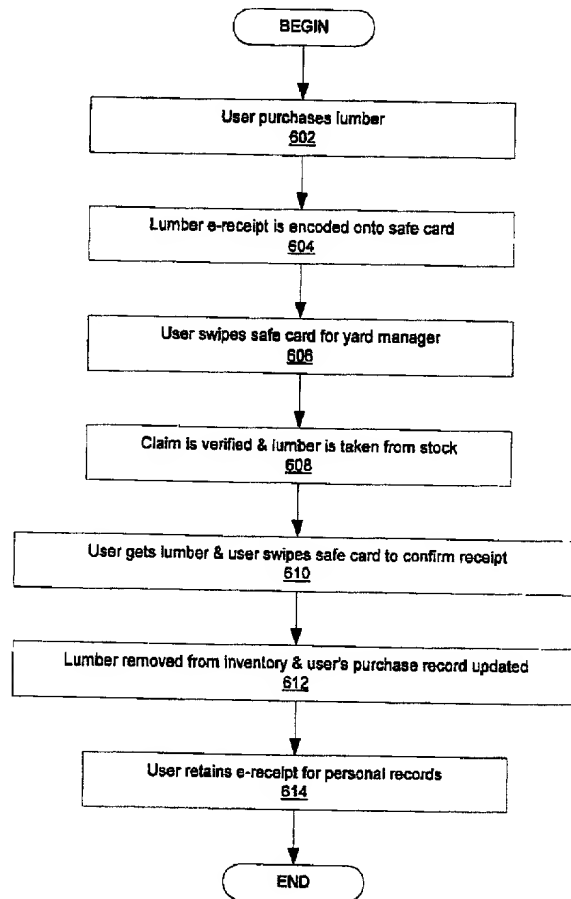
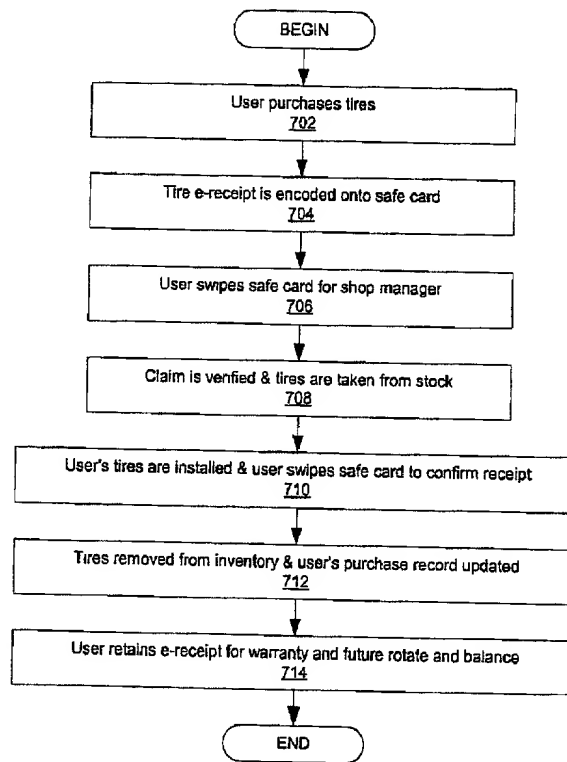
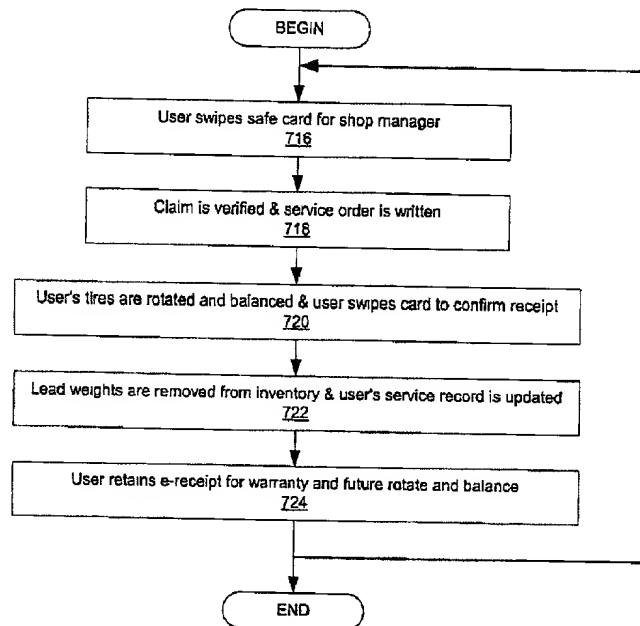


Figure 6

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Figure 7A  
AT9-99-085Figure 7B  
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**DECLARATION AND POWER OF ATTORNEY FOR  
PATENT APPLICATION**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

**METHOD AND APPARATUS FOR ENCODING TRANSACTIONS FOR GOODS AND SERVICES USING AN E-RECEIPT**

the specification of which (check one)

X is attached hereto.

\_\_\_ was filed on \_\_\_\_\_  
as Application Serial No. \_\_\_\_\_  
and was amended on \_\_\_\_\_  
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):	Priority Claimed	
_____	_____	_____ Yes _____ No
(Number)	(Country)	(Day/Month/Year)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information material to the patentability of this application as defined in Title 37, Code



of Federal Regulations, \$1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial #)	(Filing Date)	(Status)
------------------------	---------------	----------

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

John W. Henderson, Jr., Reg. No. 26,907; Thomas E. Tyson, Reg. No. 28,543; James H. Barksdale, Jr., Reg. No. 24,091; Casimer K. Salys, Reg. No. 28,900; Robert M. Carwell, Reg. No. 28,499; Douglas H. Lefevre, Reg. No. 26,193; Jeffrey S. LaBaw, Reg. No. 31,633; David A. Mims, Jr., Reg. 32,708; Volel Emile, Reg. No. 39,969; Anthony V. England, Reg. No. 35,129; Leslie A. Van Leeuwen, Reg. No. 42,196; Christopher A. Hughes, Reg. No. 26,914; Edward A. Pennington, Reg. No. 32,588; John E. Hoel, Reg. No. 26,279; Joseph C. Redmond, Jr., Reg. No. 18,753; Marilyn S. Dawkins, Reg. No. 31,140; Duke W. Yee, Reg. No. 34,285; Mark E. McBurney, Reg. No. 33,114; and Colin P. Cahoon, Reg. No. 38,836; Joseph R. Burwell, Reg. No. 44,468; Rudolph J. Buchel, Reg. No. P-43,448; Stephen R. Loe, Reg. No. 43-757.

Send correspondence to: Duke W. Yee, Carstens, Yee & Cahoon, LLP, P.O. Box 802334, Dallas, Texas 75380 and direct all telephone calls to Duke W. Yee, (972) 362-2001

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INVENTORS SIGNATURE: *Herman Rodriguez* DATE: June 8, 1999

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POST OFFICE ADDRESS: SAME AS ABOVE

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INVENTORS SIGNATURE: *Newton James Smith* DATE: JUNE 8, 1999

RESIDENCE: 11002 Bitterroot Circle  
Austin, Texas 78726

DOCKET NUMBER: AT9-99-085

CITIZENSHIP: United States

POST OFFICE ADDRESS: SAME AS ABOVE